

What is claimed is:✓

SUBB1

1. An image display apparatus for supplying gray scale data according to a video signal to a liquid crystal device to present ^a gray-scaled display and ^{for} scanning said liquid crystal ^{device} ~~panel~~ N times where N is an integer equal to or greater than 2 during one field period of the video signal, comprising:

gray scale data generating means for comparing a current video signal with a previous video signal of a predetermined period before, and generating gray scale data for N times in accordance with a comparison result; and

drive means for driving said liquid crystal device with gray scales based on said gray scale data generated by said gray scale ^{data} generating means.

2. An image display apparatus according to claim 1, wherein said predetermined period is one frame period.

3. An image display apparatus according to claim 1, wherein said predetermined period is two field periods.

4. An image display apparatus according to claim 1, wherein said gray scale data generating means includes table means for, upon reception of the current video signal and the previous video signal, outputting gray scale data according to said ^{current and previous video} ~~received~~ signals.

5. An image display apparatus according to

claim 4, wherein said table means outputs gray scale data whose number of bits is less than that of the video signals.

5 6. An image display apparatus according to claim 4, wherein said table means outputs gray scale data N times with respect to a single input of the video signals.

CL 7
NP
NK
a
10
SUB 30
7. An image display apparatus according to claim 1, further comprising a first memory for storing the current video signal and a second memory for storing the previous video signal, wherein said gray scale data generating means receives ^{the current} a video signal output from said first memory and ^{the previous} a video signal output from said second memory.

15 8. An image display apparatus according to claim 1, wherein said gray scale data generating means includes a gray scale memory having gray scale data stored in advance.

CL 9
NP
NK
25
SUB 33
9. An image display apparatus according to claim 1, wherein the gray scale data generating means includes means for supplying gray scale data representing a gray scale greater than that of the current video signal when a result of comparison between the current video signal and the previous video signal indicates that the gray scale of the current video signal is greater than that of the previous video signal, and supplies gray scale data representing a gray scale

NP
NH

smaller than that of the current video signal when the result of comparison indicates that the gray scale of the current video signal is smaller than that of the previous video signal.

5 10. An image display apparatus according to claim 1, wherein a non-display period is provided in each of said N display periods during the one field period.

10 11. An image display apparatus according to claim 1, further comprising projecting means for projecting an image displayed on said liquid crystal device.

SUB 34

a 15 12. An image display apparatus according to claim 1, further including television receiving means for receiving a television ^{signal} ~~signal~~, A/D converting means, connected to said television receiving ^{means} ~~signal~~, for converting a video signal included in the television signal into a digital video ^{signal} ~~signal~~, and means for supplying the digital video signal to said gray scale data generating means.

NH
L
N
H

20 13. An image display apparatus for supplying a gray scale signal representing one of multiple gray scales from a minimum gray scale to a maximum gray scale according to image data to a liquid crystal device to present gray-scaled display and scanning said liquid crystal panel N times, where N is an integer equal to or greater than 2, during one field period of a video

signal, comprising:

comparing means for comparing current image data with image data of one screen before; and

5 means for supplying a first modified gray scale signal indicating a gray scale greater than that of the current image data when a comparison result from said comparing means indicates that a gray scale of the current image data is greater than that of the image data of one screen before, and supplying a second modified
10 gray scale signal indicating a gray scale smaller than that of the current image data when the comparison result indicates that the gray scale of the current image data is smaller than that of the image data of one screen before.

15 14. An image display apparatus according to claim 13, wherein the first modified gray scale signal has a maximum gray scale value, and the second modified gray scale signal has a minimum gray scale value.

20 15. An image display apparatus according to claim 13, wherein said comparing means outputs a value of a difference between a gray scale indicated by the gray scale signal of the current image data and that of the image data of one screen before, as said comparison result.

25 16. An image display apparatus for supplying gray scale data according to a video signal to a liquid crystal panel to present gray-scaled display and scanning

said liquid crystal panel N times during a predetermined period, comprising:

a gray scale memory having gray scale data stored in advance;

5 read means for comparing a current video signal with a previous video signal of a predetermined period before, and reading out gray scale data from said gray scale memory N times during said predetermined period in accordance with a comparison result; and

10 drive means for driving said liquid crystal panel with gray scales based on said gray scale data read out by said read means.

17. An image display apparatus according to claim 16, wherein the predetermined period is one field period.

15 18. An image display apparatus according to claim 16, wherein the previous video signal is a video signal preceding the current video signal by two field period of the video signal.

20 19. An image display apparatus having a liquid crystal panel separated into two parts, comprising:

a first memory for sequentially storing dynamic image display data to be displayed on a first part of said liquid crystal panel;

25 a second memory for sequentially storing dynamic image display data to be displayed on a second part of said liquid crystal panel;

read means for simultaneously reading out display data stored in said first and second memories, plural number of times at a given timing; and

5 display means for presenting dynamic image display on said liquid crystal panel based on said display data read out by said read means.

20. An image display apparatus having a liquid crystal panel separated into two parts, comprising:

10 a first memory for storing display data for a first part of said liquid crystal panel; and

a second memory for storing display data for a second part of said liquid crystal panel,

15 said first and second memories being accessed for multiple reading of said display data stored therein, said display data stored in said second memory being read out in an order different from a writing order.

21. An image display apparatus having a liquid crystal panel separated into two parts, comprising:

20 a first memory for storing display data of a previous frame for a first part of said liquid crystal panel;

a second memory for storing display data of a current frame for said first part of said liquid crystal panel;

25 a third memory for storing display data of the previous frame for a second part of said liquid crystal panel;

a fourth memory for storing display data of the current frame for said second part of said liquid crystal panel; and

display data preparing means for preparing modified display data for said first part from outputs of said first and second memories and preparing modified display data for said second part from outputs of said third and fourth memories.

22. An image display apparatus according to claim 21, wherein said display data preparing means compares the output of said first memory with that of said second memory, and said output of said third memory with that of said fourth memory, and prepares the modified display data with a gray scale greater than that of current display data when a comparison result indicates that the gray scale of the current display data is greater than that of the display data of one frame before, and prepares the modified display data with a gray scale smaller than that of said current display data when the comparison result indicates that the gray scale of the current display data is smaller than that of the display data of one frame before.

SUB 23. An image display apparatus for displaying a substantially same screen a multiple number of times in a predetermined period, comprising means for providing a non-display period in a period for each of the multiple number of times display.

24. An image display apparatus according to claim 23, wherein said image display apparatus includes signal and scan electrodes, and said non-display period is a zero bias period during which a zero bias voltage is supplied to signal electrodes.

25. An image display apparatus according to claim 23, wherein said predetermined period is one field period.

26. An image display apparatus for displaying a same screen a multiple number of times in a predetermined period, comprising means for providing a period in which scan electrodes and signal electrodes are kept at a same potential in a period for each of said multiple number of times display.

27. An image display apparatus according to claim 26, wherein said predetermined period is one field period.

28. A projection type image display apparatus for projecting an image displayed on a liquid crystal panel, comprising:

comparing means for comparing current image data with image data of one frame before;

gray scale signal generating means for generating a gray scale signal representing a gray scale greater than that of the current image data when a comparison result from said comparing means indicates that the gray scale of the current image data is greater than that of the

image data of one frame before, and generating a gray scale signal representing a gray scale smaller than that of the current image data when the comparison result indicates that the gray scale of the current image data is smaller than that of the image data of one frame before; and

means for irradiating said liquid crystal panel and projecting an image on said liquid crystal panel in accordance with said gray scale signal generated by said gray scale signal generating means.

29. An image display apparatus for supplying a gray scale signal representing one of multiple gray scales from a minimum density to a maximum density according to image data to a liquid crystal panel to present gray-scaled display and scanning said liquid crystal panel a multiple number of times during a predetermined period, comprising:

detecting means for detecting if an image is changing in a direction toward a lower density or in a direction toward a higher density; and

means for supplying a gray scale signal with a higher density than that of image data to be displayed when said detecting means detects that the image change is in the direction of higher density, and supplying a gray scale signal with a lower density than that of image data to be displayed when said detecting means detects that the image change is in the direction of

lower density.

30. An image display apparatus for supplying gray scale data according to image data to a liquid crystal panel to present gray-scaled display, comprising:

5 a gray scale memory having gray scale data stored in advance;

10 read means for comparing current image data with previous image data and reading out the gray scale data from said gray scale memory in accordance with a comparison result; and

 drive means for driving said liquid crystal panel with gray scales based on the gray scale data read out by said read means.